

Application No. 10/669,285
Amendment dated April 28, 2005
Reply to Final Office Action of February 7, 2005

Docket No. 12: 1-5165

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (CURRENTLY AMENDED): A position detecting method of detecting a position of a mask formed on an object, said method comprising the steps of:

forming an image of ~~[[a]]~~ the mark on a sensor;

performing a first process that processes an image signal obtained by the sensor with respect to each of a plurality of values of a parameter of the first process;

performing a second process that ~~obtains~~ processes a signal obtained by the first process to obtain a feature value of each signal obtained by the first process with respect to each of the plurality of values of the parameter;

determining a value of the a parameter based on the feature values obtained by the second process and a reference value defined with respect to the mark; and

~~performing a third process that obtains~~ detecting a position of the mark based on an image a signal obtained by the first process using the determined value of the parameter determined in said determining step.

2 (PREVIOUSLY PRESENTED): A method according to claim 1, wherein the first process comprises zero phase filtering, and the parameter of the first process comprises an order of the filtering.

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3 (PREVIOUSLY PRESENTED): A method according to claim 1, wherein the first process comprises approximation of the image signal using a polynomial, and the parameter of the first process comprises an order of the polynomial.

4 (PREVIOUSLY PRESENTED): A method according to claim 1, wherein the feature value corresponds to an interval between elements of the mark.

5-6 (CANCELLED):

7 (CURRENTLY AMENDED): A method according to claim 1, wherein said ~~step of determining the value is performed~~ determining step determines the value of the parameter based on a deviation deviations of the feature value values from the reference value.

8 (CURRENTLY AMENDED): A method according to claim 1, wherein said ~~step of determining the value is performed~~ determining step determines the value of the parameter based on a variation of a plurality of the feature value with respect to each of the plurality of values of the parameter.

9 (PREVIOUSLY PRESENTED): A method according to claim 1, wherein the first process comprises a process for removing a noise in the image signal.

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10 (CURRENTLY AMENDED): A position detecting apparatus for detecting a position of a mark on an object, said apparatus comprising:

a detecting system to detect an image of ~~[[a]]~~ the mark; and

a processing system to perform a first process that processes an image signal obtained by said detecting system with respect to each of a plurality of values of a parameter of the first process, to perform a second process that ~~obtains~~ processes a signal obtained by the first process to obtain a feature value of each signal obtained by the first process with respect to each of the plurality of values of the parameter, to determine a value of the parameter based on the feature values obtained by the second process and a reference value defined with respect to the mark, and to ~~perform a third process that obtains~~ detect a position of the mark based on ~~an image~~ a signal obtained by the first process using the determined value of the parameter.

11 (PREVIOUSLY PRESENTED): An exposure apparatus for transferring a pattern to an object, said apparatus comprising:

a position detecting apparatus according to claim 10 for detecting a position of a mark formed on the object.

12 (CURRENTLY AMENDED): A device fabrication method comprising steps of:

transferring a pattern to an object using an exposure apparatus as defined in claim

11; ~~[[and]]~~

developing the object to which the pattern has been transferred; and

processing the developed object to fabricate the device.